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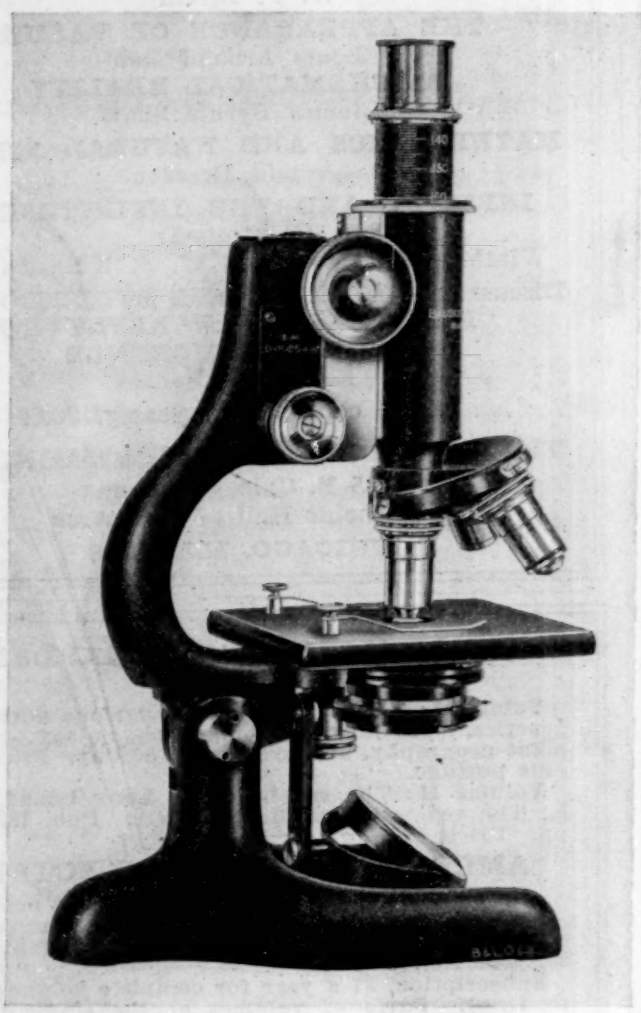

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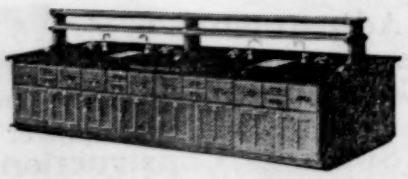

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VOL. LXIV DECEMBER 17, 1926 No. 1668

CONTENTS

The Functions of a Woman's Clinic: PROFESSOR J. WHITRIDGE WILLIAMS 581

Tertiary Man in Asia—The Chou Kou Tien Discovery: DR. DAVIDSON BLACK 586

The Pan-Pacific Research Institution 587

Scientific Events:
Standardization of Anatomical Terminology; Publications of the American Psychological Association; Associated Committees for Wild Life Conservation; Reorganization of Chemical and Soils Work in the U. S. Department of Agriculture 589

Scientific Notes and News 591

University and Educational Notes 595

Discussion and Correspondence:
Sand Flotation in Nature: PROFESSOR FRANK C. GATES. *The Neighbors:* PROFESSOR FRANK SCHLESINGER. *Field Trips in Geography:* PROFESSOR A. K. LOBECK. *Brevity at Botanical Banquets:* DR. NEIL E. STEVENS 595

Scientific Books:
Coolidge's Introduction to Mathematical Probability: DR. BURTON H. CAMP 598

Special Articles:
The Opah or Moonfish on the West Coast of Florida: DR. E. W. GUDGER. *Application of the Lipman-Gordon Method of Tree Injection:* A. GORDON and C. B. LIPMAN. *The Chemical Constitution of Thiasine:* E. B. NEWTON, STANLEY R. BENEDICT and H. D. DAKIN 600

Science News x

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THE FUNCTIONS OF A WOMAN'S CLINIC[1]

THIS title was suggested by Dr. Chipman when he did me the honor of inviting me to speak to you on this occasion.

I accepted the invitation with pleasure for three reasons: First, because Dr. Chipman has long been one of my very good friends, for whose medical attainments and personal qualities I have the highest respect and the greatest admiration; secondly, because I love to renew my associations with this great hospital and university where I feel more at home than anywhere else, except in Boston and my native city; and lastly because I have certain definite views concerning the functions of a woman's clinic and gladly embrace the opportunity to express them.

After you have inspected this imposing clinic which constitutes so great an addition to the facilities of the Royal Victoria Hospital and of McGill University, and which has been made possible by the generosity of the Provincial Government, of Sir Herbert Holt and of the Montreal Maternity Hospital, I feel sure that you will agree with me that the people of the Province of Quebec, and of Canada generally, are to be congratulated upon so visible a sign that its women can receive amid such surroundings the best possible care in their sufferings and ills; that McGill University must rejoice in the increased facilities which the clinic will afford for the instruction of its students and for the stimulation of research in obstetrics and gynecology; and that Dr. Chipman and his associates must exult in the fulfilment of their dreams for ideal surroundings in which to carry on their work. At the same time I venture to surmise that they are experiencing some searchings of conscience as to whether they, or any one else for that matter, will be able to attain, even to a slight extent, the ideals which all of us have in mind.

What is a university woman's clinic? You will note that I emphasize the word university, for therein lies the crux of the matter. I would define it as an adequately equipped hospital limited to the care of women suffering from the infirmities of their sex, and manned by highly trained physicians with uni-

[1] Read at the opening of the new Maternity Pavilion of the Royal Victoria Hospital, Montreal, October 29, 1926.

versity ideals. In it medical students are to be trained, and serious efforts are to be made to discover at least some of the secrets connected with the normal and abnormal functioning of the female reproductive system, as well as of its interdependence with other organs of the body. Such a conception is relatively new in English-speaking lands, for, although we have had for years women's hospitals, lying-in hospitals, maternity hospitals, as well as other hospitals with undescriptive and ambiguous designations, they were all organized to care for sick women along purely humanitarian lines, were only indirectly concerned with education and not at all with research. Indeed, hospitals still exist which limit their humanitarianism to "respectable married women only," forbid teaching within their walls, have no conception of what research means and would regard the suggestion of animal experimentation as anathema. In general, it may be said that the idea of the university woman's clinic originated in Germany, where its best type has constituted an ideal which we are just beginning to imitate.

As soon as considerable aggregations of people came together in cities, it became necessary to devise methods of caring for the sick poor, and hospitals and infirmaries developed, but it was not until much later that women in childbirth were thought of. As far as I can learn, their care was first attempted in Paris during the reign of Saint Louis in the thirteenth century. At that time an addition was made to the Hotel Dieu, and in its basement was organized a service "des acouchiez," and nearly a century later we learn that it was supervised by a ventrière named Juliette (1378). In the quaint language of the times its habitation was described as follows—"the fifth ward, below this large 'salle' is in a retired and close location, and there are the pregnant women and those in childbirth, for it stands to reason and is quite proper that women in childbirth should be in a retired and secret place, and should not be visible like other sick persons, and the ward contained 24 beds." Indeed, somewhat similar ideas prevailed in the States until after I had graduated, and any quarters were thought good enough to accommodate pregnant women, who were regarded as unfit associates for other types of patients. In the reign of Francis the first, the conditions at the Hotel Dieu had altered but little except in size, and the "salle des accouchées" was a cellar-like structure, "which was so low down that at high water the level of the Seine was one foot below the windows and two feet above the beds —from which came and any day may come great inconveniences." It might be added that the patients slept four in a bed, and no distinction was made as to whether they were pregnant or delivered, sick or well. In such circumstances, puerperal infection became a constant scourge, and the only great improvement effected before the time of the revolution was to limit the number of patients to two in each bed and to attempt to separate them by a plank down its center.

During the revolution the Maternité was moved to the Abbey Port Royal, where it still remains. It is scarcely necessary to mention that it was rendered famous by Madame LaChapelle and Baudelocque, and particularly by the work of Tarnier, who eventually demonstrated that patients could be delivered more safely there than in their own homes. While a long series of more or less famous men served in an advisory capacity as surgeons accoucheur, the Maternité was directed as a school for midwives by a succession of maitresses sage-femme, and was rigorously closed to medical students and even to so eminent a medical man as De la Motte. It is only fair to state that this exclusion was due to clerical rather than feminine influence.

Except for private courses given by practitioners in their own quarters, it should be recalled that no instruction in obstetrics was available for medical students until 1745, when the University of Paris authorized a theoretical course, and it was not until one hundred years later that the first clinique was opened for practical instruction. It should likewise be remembered that the inspiriting courses of William Hunter and Smellie were not given in the hospitals or medical schools of London, but were private enterprises conducted without supervision in their own premises.

For these reasons, it was highly significant that soon after Johann Jacob Fried had been appointed head of the Maternity of Strasbourg, he was able to persuade those in authority to permit its utilization for the training of medical students as well as of midwives, and to lodge its control in trained medical men. Fried at once stimulated those working with him to attempt to extend the bounds of obstetrical knowledge, so that it may be truthfully said that he organized the first woman's clinic in the world about 1730. He lived to direct its activities for thirty-nine years, and he built upon such firm foundations that Osiander years afterwards described it as "the mother school of all institutes of the kind in Germany."

In 1751, one of Fried's most promising pupils, Roederer, organized the clinic of Göttingen, and during his short life, for he died at the age of thirty-nine, rendered it famous for all time by his important contributions. Following this, professorships and later clinics were gradually organized in all the German and Austrian universities, although many of them did not attain prominence until after the Franco-

Prussian war. From then onwards, every German university had its Frauenklinik, in which obstetrics and gynecology were taught and practiced by a single chief. Most of them were equipped with adequate laboratories for scientific work, and, with a few notable exceptions, the chiefs were chosen not merely because they were good clinicians and teachers, but because they had made more or less important contributions to the science of medicine.

In France, unfortunately, there was no similar development. Obstetrics and gynecology became separated, and while excellent obstetrical hospitals developed in the larger cities, they were poorly equipped from a scientific point of view. They trained many excellent clinicians, who failed to add materially to our stock of knowledge. Gynecology became affiliated with surgery, with the result that its scientific aspects were neglected, and the gynecologists suffered as much from their lack of knowledge of obstetrics as did the obstetricians from the lack of sound surgical training, while both suffered from failing to gain a comprehensive view of the normal and abnormal functioning of the female reproductive system, which, aside from its practical aspects, greatly limited their capacity for fruitful investigation, even had the universities been able to afford adequate material support.

Time does not permit any adequate consideration of the conditions in Great Britain, but all who are familiar with them know that it does not possess a single institution which compares favorably with the best German Frauenkliniks before the war. It is in great part on that account that we regard so highly our colleagues in Edinburgh, who, in spite of the lack of adequate clinical facilities and material resources, have succeeded in maintaining a tradition for productive work. For similar reasons, I must forego any allusion to conditions in the United States, and it must suffice to state that it is only within the past few years that we have begun to establish adequate university woman's clinics, and at present we are not as well off as was Germany fifty years ago. Consequently, there can be little wonder that our students are poorly trained, and that in the richest country in the world the puerperal death-rate is higher than in any civilized country except Chile and New Zealand.

What are the functions of a university woman's clinic? All will agree that they are threefold, namely, the best possible care of patients, the adequate training of students, and the fostering of research, and I shall consider each function separately and two of them in some detail.

The Care of Patients

No argument is needed that the first function of the clinic is the best possible care of the patients entrusted to it, as enlightened treatment of the sick is rightly regarded as a fundamental obligation to the community, and, in an institution such as this, to the donors who have so generously made possible its erection. There need be no anxiety along such lines, for the tradition long since established at the Royal Victoria Hospital makes anything else unthinkable.

The Teaching of Students

It depends upon one's point of view whether the teaching of students or the fostering of research is to be regarded as the more important function of a university clinic, although I believe that the former, if properly done, is a potent stimulus to the latter. Here the conditions are ideal for good teaching, for the relationship between the hospital and university is such as to insure that the headship of the clinic will always be in competent hands, as is evidenced by the agreement entered into by the hospital, to the effect "That so long as the present individually appointed Governors of the Royal Victoria Hospital remain in office, or constitute a majority of the Board of Governors, the Professor of Obstetrics and Gynecology in the Medical College of McGill University shall ipso facto be Chief of this Clinic, in the said Maternity Pavillion." This is as it should be, and places the responsibility where it belongs; moreover, it is inconceivable that in choosing professors in the future the university will fail to secure the very best available.

The proper type of professor being assured, it is probable that he will be wise in the selection of his associates, and this brings us to the consideration of what should be taught. Here you are fortunate in being able to teach obstetrics and gynecology together, for, in addition to uniting the two subjects into a comprehensive whole, it makes possible the elimination of much reduplication of effort and enables the student to regard the various functions of the female generative tract in their proper perspective and to realize that the better that of childbearing is supervised the less will the others become deranged. Consequently, no matter whether the future practitioner limits his work to obstetrics or to gynecology, or practices both branches, he will have a sounder foundation upon which to build than had he been taught each subject independently, no matter how brilliant his teachers may have been.

Passing to the consideration of who shall be taught, the requirements of three types of students must be borne in mind, namely: the medical student on his way towards the degree of doctor of medicine, the graduate, who, after his interne service, desires to prepare for special practice or to fit himself for a career of teaching and research, and the practitioner

who wishes to spend a few weeks in making good deficiencies in his original education. In my opinion, it is the duty and privilege of the university clinic to foster the interests of the first two groups, but I believe it will do well to refer to another type of institution such students as desire so-called extension or "refresher" courses. Naturally, one sympathizes with their desire for improvement, but in general it would seem inadvisable to allow the university staff to dissipate its energies in rudimentary instruction, for those whom experience teaches will profit but little from it. It goes without saying that such practitioners should receive a cordial welcome when they wish to spend a few days in the clinic, but, except in unusual cases, they should be referred to specially devised post-graduate schools for instruction especially adapted to their needs.

On the other hand, one of the important functions of a university clinic must be the training of regular medical students, and, if they are of proper caliber, no effort is too great to be expended upon them, for it is in great part from them that the successive house staffs must be recruited, and the best of them will constitute a considerable proportion of the advanced students upon whom the ultimate reputation of the clinic will depend. For such students, the 117 ward beds will furnish adequate material for clinical instruction unless the classes are allowed to become unwieldy, while the attainments of the present teaching staff will insure sound instruction.

It is, however, even more important for the educational usefulness of the clinic that adequate opportunity be afforded to graduates who desire to spend several additional years in preparation for their life's work. A certain proportion of them can best be trained by appointment to a long-term house service, in which routine clinical duties will not occupy their entire time, but instead several hours of each day will be available for such investigative work as they are fitted to undertake. Moreover, I feel that after the completion of the first year of service, certain minor teaching duties should be assigned to them, which should be increased in amount and importance as their ability becomes demonstrated. On the other hand, if they show no signs of intellectual curiosity, their service should be short. Graduate students for whom hospital posts can not be found constitute a more difficult problem. In general, they should not be admitted unless they give promise of doing creditable work, and never for a shorter period than one year. In addition to being afforded facilities for clinical improvement, each should be assigned a definite piece of work, for whose solution he should be held responsible. Those who come with a problem already in mind are doubly fortunate, but for those who do not, one must be selected, and for that purpose the suggestions of intelligent younger members of the staff are frequently invaluable.

In this connection, a word concerning the qualifications of the teachers, as it is my conviction that our universities frequently sin grievously in the constitution of the staffs of clinical departments by allowing them to become clogged with practitioners who have outlived their university usefulness. For this reason, I believe that appointment to all posts below that of the chief should be for a stated period, and that only those who are engaged in productive work should be eligible for reappointment—with the possible exception of an occasional unusually brilliant teacher. In my experience, nothing so deadens a clinical department as the prolonged presence upon its staff of men in active practice who have become so engrossed in outside obligations that they are unable to find time for investigation of any sort. Such men, beside exerting a pernicious influence upon promising young men, clog the line of promotion by occupying posts which should be filled by those who are anxious to advance the bounds of knowledge. Unfortunately, conduct of a department along such lines demands a ruggedness of fiber and a degree of moral courage which few chiefs possess, and they usually find it easier to say that art is long and life is short, and that the cemetery will eventually solve the difficulty.

RESEARCH

In the present state of medical education on this continent, it would appear that the most important university function of a woman's clinic consists in the fostering of research, whose objective should be the discovery of the biological principles which underlie our daily clinical observations. It is not generally understood that one can scarcely be an inspiring teacher unless he is seriously interested in the fundamental bases of his specialty, and unless he is able to speak with that authority which comes from first-hand knowledge—which is vastly different from the ability to talk glibly of what others have discovered. Teachers of this type, however, are not common, and when found are difficult to satisfy, as they are not content with a reasonable clinical material and a few class rooms. In addition, they demand well-equipped laboratories, scientific associates, trained technicians and a reasonable budget, and, like the horse leech's daughters, are constantly crying "give, give"—not, however, for increase in personal salary, but for means with which to broaden their investigations.

The maintenance of the research end of an efficient clinic requires a considerable endowment, which unfortunately, I understand, is lacking here. Conse-

quently, the following remarks are made in the hope that they may reach the ears of some potential benefactor and impress him with the desirability of making good the deficiency. Generally speaking, medical research may be along clinical or fundamental lines, while in many instances the two are advantageously combined. By the former are understood such advances as may result from the critical analysis of large series of accurate clinical observations, from the development of especial skill in the study of certain phenomena of disease, or from the devising of new operative or technical procedures. Naturally, such contributions are highly important, and will continue to be made, but in view of the great advances which have occurred in all branches of medicine, it is becoming increasingly difficult to make important discoveries by the unaided use of the five senses and a scalpel. In this connection it may be said the layman scarcely appreciates the extent to which the fundamental sciences have become ancillary to medicine, and that within a short time after its discovery almost every important contribution to pure science is utilized in medical investigation. For these reasons, it can scarcely be expected that fundamental advances can be made by the pure clinician, unless he has associated with him medical men who are well trained in one of the pure sciences or in one of the biological sciences which constitute the basis of all medicine.

In general, it may be said that a relatively modest scientific equipment for an ideal university woman's clinic should consist in small laboratories for biochemical, physiological, bacteriological and pathological research, and at the head of each must be a man who has spent years, before or after completing his clinical education, in perfecting himself in some science. Naturally, the type of work to be undertaken will vary according to the talents available, as well as with the trends which are dominating scientific work at the moment, and it must always happen that there will be great variations in the merits of the several subdepartments in various clinics.

In a woman's clinic, it is essential that the men responsible for such subdivisions shall be competent clinicians and surgeons, but their practical and investigative work will be so engrossing that they will not be able to engage in outside private practice, and consequently they must be paid salaries sufficient to enable them to marry and eventually to support a small family in moderate comfort. This means that they must be upon the so-called full-time or university basis, and if the greatest efficiency is to be obtained, and stagnation and onesidedness prevented, provision must be made for them to pay occasional visits to Europe and to the educational centers of this continent, and this can only be done on a prolonged leave of absence with full salary or by some form of subvention. It should constantly be borne in mind that the young man in private practice is justified in borrowing money to pay the expenses incident to such trips, as he has every expectation that the practical benefits accruing from it will soon compensate for the money spent; but it is not so with the comparatively low salaried full-time man, to whom such an indebtedness will remain a burden for years.

In general, it should be laid down as a rule that no one should be appointed upon a full-time clinical staff who does not command a mastery of some science in addition to his clinical training, or at least who is not prepared to attain it. If such a rule is followed, the clinic will soon have connected with it a number of enthusiastic highly trained men who will be prepared to attack various more or less fundamental clinical problems with some assurance of leading them to a satisfactory solution. It is my conviction that it is inadvisable to take up problems which are without clinical bearing; such should be carried out in the underlying scientific departments of the university where they belong, while the medical investigator should concentrate his interests upon phenomena observed at the bedside or in the operating room.

I hope that my hearers will not misconstrue what I have said, as I have no desire to argue in favor of placing the entire clinical staff upon a full-time basis, as I recognize full well the advantages which may accrue to the clinic from its connection with a number of men who are engaged in practice, but what I wish to emphasize is that fundamental investigative work can only be expected from scientifically trained men who are prepared to devote themselves to it and to make the heavy financial sacrifices which are incident to such a career.

In this continent excellent clinicians and clinical teachers abound, but we have very few really productive men, and I take it that one of the important functions of a university clinic is to do everything possible to foster them. If we are honest, we must confess that we have practically no exact knowledge concerning the fundamental basis for any of the normal or abnormal functions of the female generative system, and that the only problems of the kind which are approaching solution are those concerned with certain phenomena associated with ovulation and the anatomical changes accompanying it, and they are being solved by anatomists, embryologists and physiologists instead of by those who are primarily interested in obstetrics and gynecology. We frequently hear it said by practical medical men that gynecology is a dying specialty and that obstetrics has been dead for years. Doubtless, this is correct if one has only

operative procedures in mind, but, on the other hand, I think it must be admitted, if we approach the question from a scientific point of view, that there is no field of medicine in which so much awaits discovery. The practically minded man may in turn reply that that is possibly correct, but that most of the unsolved problems are of scientific interest only and have little or no bearing upon the relief of suffering or the cure of disease.

This being the case, I can not refrain from enumerating certain of the problems which are in urgent need of solution and after that I shall be content to have the unprejudiced hearer decide whether they are important or not. For example, what do we know concerning the actual nature and cause of normal menstruation? Do we realize that millions of women are incapacitated for some days each month as the result of its abnormal course and that we are unable to relieve it much more efficiently than our grandfathers? Do we realize that we know almost nothing about sterility and its cure, except when it is due to frankly mechanical causes? What do we know about the cause and prevention of carcinoma, or why is it that every third colored woman develops uterine myomata after passing the fortieth year. Likewise, we are practically ignorant as to why uterine displacements follow every third or fourth normal labor, and until such information is forthcoming our treatment of the abnormality must remain empirical. What do we know concerning the endocrine and metabolic changes associated with the menopause or concerning their rational control? Every one knows that the pregnant woman falls into labor approximately ten lunar months after conception, but we are as ignorant of its cause as was Job concerning the wild goats of the mountain or the hinds that calve. Imagine what a boon it would be both to womankind and to obstetricians, when it becomes necessary to induce labor, if it could be done safely and efficiently by the hypodermic injection of some substance which will eventually be discovered. We are just beginning to learn the wonderfully economical manner in which nature keeps house during pregnancy, but our knowledge of the finer details of metabolism during that state are woefully incomplete.

Do we realize that thousands of women go through untold mental anguish each year because of the fact that, while they conceive readily, the pregnancy comes to an untimely end as soon as it attains a certain stage, and that we are as powerless to prevent it as when our grandfathers talked of rheumatism of the womb.

All statisticians who write upon maternal mortality point out that from 25 to 30 per cent. of all maternal deaths are due to the toxemias of pregnancy, and yet we are as ignorant concerning their true cause as a generation ago. The same statisticians tell us that a further 40 per cent. of deaths are due to puerperal infection, and we are still debating whether or not there is a scientific basis for autoinfection. Moreover, while infection can generally be prevented by the employment of suitable prophylactic measures, we can do little more to cure it, when it develops, than could Semmelweiss eighty years ago. The entire field of bacteriology in so far as the pregnant and parturient woman is concerned is in urgent need of cultivation, and we still have to devise methods of coping with bacterial invasion and of increasing the patients' power of resistance to it.

I could continue to enumerate similar problems indefinitely, but what has been said should suffice to indicate that they are abundant and urgent, and I can conceive of no worthier function of a woman's clinic than to afford opportunities to men who are anxious and willing to devote themselves to such investigations.

J. WHITRIDGE WILLIAMS
THE JOHNS HOPKINS HOSPITAL

TERTIARY MAN IN ASIA—THE CHOU KOU TIEN DISCOVERY[1]

A RICH fossiliferous deposit at Chou Kou Tien seventy li to the southwest of Peking was first discovered in the summer of 1921 by Dr. J. G. Andersson and later surveyed and partially excavated by Dr. O. Zdansky. A preliminary report on the site was published by Dr. Andersson in March, 1923,[2] followed in October of that year by a brief description of his survey by Dr. Zdansky.[3] The material recovered from the Chou Kou Tien cave deposit has been prepared in Professor Wiman's laboratory in Upsala and subsequently studied there by Dr. Zdansky. As a result of this research Dr. Andersson has now announced that in addition to the mammalian groups already known from this site there have also been identified representatives of the Cheiroptera, one cynopithecid and finally two specimens of extraordinary interest, namely, one premolar and one molar tooth of a species which can not otherwise be named than *Homo? sp.*

Judging from the presence of a true horse and the

[1] Announcement of the Chou Kou Tien discovery was first made by Dr. J. G. Andersson on the occasion of a joint scientific meeting of the Geological Society of China, the Peking Natural History Society and the Peking Union Medical College held in Peking on October 22, 1926, in honor of H. R. H. the Crown Prince of Sweden.

[2] Mem. Geol. Surv. China, Ser. A, No. 5, pp. 83 to 89.

[3] Bull. Geol. Surv. China, No. 5, pp. 83 to 89.

absence of *Hipparion,* Dr. Andersson in his preliminary report considered that the Chou Kou Tien fauna was possibly of upper Pliocene age, an opinion also expressed by Dr. Zdansky. It is possible, however, in the light of recent research that the horizon represented by this site may be of Lower Pleistocene age. Whether it be of late Tertiary or of early Quaternary age the outstanding fact remains that for the first time on the Asiatic continent north of the Himalayas archaic hominid fossil material has been recovered accompanied by complete and certain geological data. The actual presence of early man in eastern Asia is therefore now no longer a matter of conjecture.

While a complete description of these very important specimens may shortly be expected in *Palaeontologia Sinica,* the following brief notes may be of interest here. One of the teeth recovered is a right upper molar, probably the third, whose relatively unworn crown presents characters which appear from the photographs to be essentially human. The posterior moiety of the crown is narrow and the roots appear to be fused. The other tooth is probably a lower anterior premolar of which the crown only is preserved. The latter also is practically unworn and appears in the photograph to be essentially bicuspid in character, a condition usually to be correlated with a reduction of the upper canine.

The Chou Kou Tien molar tooth though unworn would seem to resemble in general features the specimen purchased by Haberer in a Peking native drug shop and subsequently described in 1903 by Schlosser. The latter tooth was a left upper third molar having a very much worn crown, extensively fused lateral roots and from the nature of its fossilization considered by Schlosser to be in all probability Tertiary in age. It was provisionally designated as *Homo? Anthropoide?* It is of more than passing interest to recall that Schlosser in concluding his description of the tooth pointed out that future investigators might expect to find in China a new fossil anthropoid, Tertiary man or ancient Pleistocene man. The Chou Kou Tien discovery thus constitutes a striking confirmation of that prediction.

It is now evident that at the close of Tertiary or the beginning of Quaternary time man or a very closely related anthropoid actually did exist in eastern Asia. This knowledge is of fundamental importance in the field of prehistoric anthropology; for about this time also there lived in Java Pithecanthropus, at Piltdown Eoanthropus and but very shortly after at Mauer the man of Heidelberg. All these forms were thus practically contemporaneous with one another and occupied regions equally far removed respectively to the east, to the southeast and to the west from the central Asiatic plateau which it has been shown elsewhere most probably coincides with their common dispersal center. The Chou Kou Tien discovery therefore furnishes one more link in the already strong chain of evidence supporting the hypothesis of the central Asiatic origin of the Hominidae.

DAVIDSON BLACK
DEPARTMENT OF ANATOMY,
PEKING UNION MEDICAL COLLEGE,
PEKING, CHINA

THE PAN-PACIFIC RESEARCH INSTITUTION

THE Pan-Pacific Research Institution is attempting in Honolulu an experiment in providing a home where actual research workers, other than executives, may gather and meet together without supervision, to pursue their chosen work alone or with the cooperation of congenial companions of their own selection. In other words, any scientist on sabbatical leave or other vacation if interested in research work, especially along the lines of food and population problems in the Pacific area, would be welcomed as a guest at the Pan-Pacific Research Institution in Honolulu and given a home for the period of time spent in actual research work.

The institution has no laboratories of its own, but those of existing scientific organizations are at the service of the scientists making their temporary home at the institution. A corps of student helpers is maintained—young men of several Pacific races who are given homes at the institution and are taking science courses at the university. They are aided financially in return for any service rendered visiting scientists or those resident in Hawaii and connected with the institution.

About one hundred scientists, entomologists, plant pathologists, agronomists, ichthyologists, biologists, etc., form the local science council of the institution. Some thirty of these dine together each Friday night at the institution at a conference meal; a popular science lecture, open to the public, is given later in the evening in the auditorium of the institution. The institution has the use of some seven acres of ground with several commodious and extensive buildings where might be comfortably housed forty or fifty visitors and workers; additions are contemplated.

The Pan-Pacific Research Institution was organized by the Pan-Pacific Union pursuant to resolutions passed at the first Pan-Pacific Food Conservation Conference, the carrying out of the plan being made possible by two of the directors of the union, Messrs. George and William Castle, who placed the splendid property in Manoa Valley in Honolulu at the service

of the union for this purpose. Dr. David Starr Jordan was a guest and worker at the institute with a dozen representative scientists from Pacific lands during the organization period in 1925, and is the president of the Pan-Pacific Research Institution. During Dr. Jordan's stay as a guest of the institution the first Pan-Pacific Fisheries Conference was held, the delegates being guests of the institution and making their home there with Dr. Jordan for a month or more. Out of this first small Pan-Pacific family meeting of scientists grew the publication of the *Journal* of the Pan-Pacific Research Institution, one of the objects of which, being carried on under the direction of Dr. Jordan, is the serial publication of a check list of the fish in the Pacific Ocean and in the fresh waters of Pacific lands. This will be used as a basis of study of the possibilities of the Pacific in providing, under scientific propagation and conservation, fish food for the entire world.

In the insect and animal kingdom similar check lists are in preparation and a directory of the research institutions and workers in Pacific lands is being published.

From time to time it is planned to call together small familiar conferences of scientists interested in some particular line of research work and house these at the institution for a sufficient length of time for them to secure results satisfactory to themselves. At the present time the following councils have been organized in Honolulu in connection with the research institution, and it is hoped that kindred councils may be organized in each Pacific land, where they may all work together in harmonious cooperative effort:

Aquatic Resources Council, Dr. David Starr Jordan, *chairman.*

Plant Constituent Council, Dr. Nils P. Larsen, medical director, Queens Hospital, *chairman.*

Crop Development Council, Professor F. G. Krauss, agriculturist, University of Hawaii, *chairman.*

Race and Population Study Council, Kilmer O. Moe, agriculturist, Kamehameha Schools, *chairman.*

Health and Sanitation Council, Dr. C. B. Cooper, *chairman.*

Pan-Pacific Botanic Garden Council, Willis T. Pope, horticulturist, U. S. Agricultural Experiment Station, *chairman.*

Animal Husbandry Council, Professor L. A. Henke, professor of agriculture, University of Hawaii, *chairman.*

Meteorological and Topographical Council, E. A. Beals, meteorologist, *chairman.*

Pan-Pacific Legislative Council, Colonel F. M. Brown, *chairman.*

Entomological Council, Professor J. F. Illingworth, research associate in entomology, Bishop Museum, *chairman.*

Frederick Muir, *chairman,* Pan-Pacific Science Council.

These chairmen constitute the board of directors of the Pan-Pacific Research Institution.

The chief reasons for confining membership in the institution to actual research workers other than executives, are that in the two years of weekly dinner gatherings, it has been found that the actual research workers feel much more free to express themselves when alone and that the executives as a rule cease to be actual research workers, having forced upon them their own problems which do not always appeal to the actual research workers. Moreover, the research workers, thrown on their own responsibilities and compelled to accept chairmanships of committees that usually go to executives, are developing a sense of leadership and responsibility that is valuable.

The Pan-Pacific Botanic Garden Council has begun work in establishing a Pan-Pacific Botanic Garden in Hawaii, the plan being to introduce trees from every part of the Pacific, with the belief that they will grow somewhere in Hawaii, either at sea level, where heat is tropical, or up to eight thousand to ten thousand feet on the higher mountains, where trees and plants of the temperate zones seem to thrive to perfection. The Prince of Chandaburi, brother of the King of Siam, planted the first tree in the Pan-Pacific Botanic Garden collection during his visit to the Pan-Pacific Research Institution more than a year ago, and on Pan-Pacific or Balboa Day, September 17, 1926, the members of the council in Honolulu planted trees from each Pacific country along the Nuuanu stream on the Island of Oahu, which has been turned over to the council by the city as a beginning of an experimental Pan-Pacific Botanic Garden. This stream begins at an elevation of more than one thousand feet in Nuuanu Valley and flows to the sea.

The Pan-Pacific Medical Council has done considerable work in preparation for the Pan-Pacific Medical Conference in Honolulu in 1929. Its chairman, Dr. Nils P. Larsen, has visited the leading surgeons and medical men in America, securing their interest as well as the interest of some of the most distinguished medical men in Pacific countries.

The Pan-Pacific Legal Council is also preparing the way for a conference of representatives of legal organizations in Pacific lands. The Pan-Pacific Fisheries Council has held one conference and is preparing publications giving a check list of the fish of the Pacific and other data as a basis of future work in the study of the fish of the Pacific.

The Entomological Council is undertaking to get together a check list of injurious insects in Pacific lands and their parasites, for publication in the *Journal* of the Pan-Pacific Research Institution.

This council is also contemplating the calling of a Pan-Pacific Entomological Conference in Honolulu.

The Pan-Pacific Editorial Council has established a quarterly publication as a *Journal* of the institution and has a board of editors composed of the leading scientists in all Pacific lands.

The crop development and other councils are laying foundation for serious work and cooperating thoroughly in the work of their companion councils.

Executives who are also research workers are often welcomed at the institution in their capacity as research workers. The members of the institution will employ their own executives when needed and they may not be scientists, merely experienced men to carry out the wishes of the scientists in regard to general management. It is felt that the executive is usually the man who has, or can secure, the means for travel and expenses abroad, while the research worker is often unable to do this, so that, while the help, cooperation, association and good will of the executive is always desired and his visits looked forward to, the Pan-Pacific Research Institution is a purely democratic organization of research workers who are all equals in a family of scientists who are devoting their time to the service of mankind.

SCIENTIFIC EVENTS

STANDARDIZATION OF ANATOMICAL TERMINOLOGY

THE following circular from the scientific relations section of the International Institute of Intellectual Cooperation at Paris has been received by the American national committee of the institute with a request that it be brought to the attention of American anatomists:

M. de Castro, dean of the faculty of medicine of Rio de Janeiro, has recently brought before the International Institute of Intellectual Cooperation a project for the standardization of terminology in anatomy and nosology.

The utility of such an undertaking is evident. It is an admitted fact that considerable misunderstanding arises among scholars through the divergence existing in scientific terminology. Thus bibliographical work is complicated and the propagation of scientific knowledge is seriously and unnecessarily impeded.

After examination, M. de Castro's proposal was brought before the sub-committee on bibliography of the Committee on Intellectual Cooperation of the League of Nations which met at Geneva on the 23rd and 24th of July, 1926.

It was decided that M. de Castro's proposal concerning nosological terminology should be referred to the health committee.

With regard to anatomical nomenclature, it has not been possible up to the present to draw up an anatomical nomenclature that would be acceptable to all nations. But, considering that there already exists a nomenclature known as "Nomina Anatomica," which was adopted by a certain number of countries after the International Congress held in 1895, under the auspices of the "Anatomisches Gesellschaft" at Basle and also that this nomenclature constitutes an appreciable step towards the standardization of anatomical terms, the sub-committee on bibliography has decided to recommend scientists belonging to countries not accustomed to using the "Nomina Anatomica," that they place this terminology in brackets in addition to the national terms used in their textbooks, treatises and other scientific publications.

The International Institute of Intellectual Cooperation has the honor to inform you of this resolution of the subcommittee on bibliography in the hope that, in the interest of international scientific collaboration, you will be willing to give it the benefit of your serious attention.

(Signed) J. S. DE VOS VAN STEENWYK,
Assistant Head of the Scientific Relations Section

PUBLICATIONS OF THE AMERICAN PSYCHOLOGICAL ASSOCIATION

IN January, 1925, the American Psychological Association bought the stock of the Psychological Review Company, Inc., and became the sole owner of the journals published by that company, namely, the *Psychological Review,* H. C. Warren, editor; the *Psychological Bulletin,* S. W. Fernberger, editor; *The Psychological Index,* Madison Bentley, editor, and the *Journal of Experimental Psychology,* J. B. Watson, editor. The Review Company has acted as publishers of the "Psychological Monographs" with S. I. Franz as editor. The monographs, however, are owned by the respective authors. It is the plan of the association to continue to publish the monographs on a percentage basis as heretofore.

In order to comply with legal formalities, the association became incorporated before purchasing the journals. The members of the council of the association became the directors of the company. The former editors were all retained. Subsequently Professor Watson resigned from the *Journal of Experimental Psychology* on account of pressure of business. Professor Bentley became editor of that journal, and Professor Hunter was appointed editor of the *Psychological Index.*

The transfer of ownership of the journals resulted from the desire of many of the psychologists to have the scientific journals under public rather than private ownership. There are certain rather obvious advantages. In the first place, there is the assurance that the profits, if any, will be used to improve the journals and to reduce the subscription rates, and secondly, the policy of the journals will be subject to the wishes of a majority of the persons served, rather

than to those of an individual. Influenced by this principle of public ownership, Dr. Morton Prince presented the *Journal of Abnormal and Social Psychology* to the association last year. He was retained as editor, and President H. T. Moore, of Skidmore College, was appointed the assistant editor.

In January, 1927, the American Psychological Association will publish a new journal, *Psychological Abstracts*. It will be edited by Professor Walter S. Hunter, of Clark University, assisted by a number of distinguished cooperating editors from foreign countries. The journal will be international in character. It will consist of non-critical abstracts of articles and books on psychological and cognate subjects, which will appear as soon as possible after the original publication. These abstracts will be prepared by competent psychologists in America and Europe. They will be published in English and will average one hundred and fifty words each.

The scope of the journal is indicated by the accompanying classification of its material: General topics in psychology; sensation and perception; feeling and emotion; attention, memory and thought; nervous system; motor phenomena and action; plant and animal behavior; evolution and heredity; special mental conditions; nervous and mental disorders; social functions of the individual; industrial and personnel problems; childhood and adolescence; educational psychology; biometry and statistics; mental tests.

It is the intention of the association to make the abstract journal invaluable, not only to psychologists throughout the world, but also to all persons who are working in allied fields, such as physiology, psychiatry, education and biology. The price of the journal has been fixed for the present at six dollars. It will probably be possible in the near future to reduce the price, unless it seems more advisable to increase the size of the publication.

H. S. LANGFELD,
Business Editor
PRINCETON UNIVERSITY

ASSOCIATED COMMITTEES FOR WILD LIFE CONSERVATION

WITH the formation of the Associated Committees for Wild Life Conservation, representing the Massachusetts Audubon Society, the Massachusetts Fish and Game Protective Association and the Federation of the Bird Clubs of New England, Inc., a step has been taken in the direction of combining the efforts of these organizations in conservation matters of common interest to all three. It has been felt for some time by those who have urged this step that much duplication of effort could be avoided and greater results could be obtained by such joint action. Those who hunt birds with guns and those who hunt with glasses are alike keen to uphold and enforce the laws protecting birds. All realize that it is essential to provide reservations and sanctuaries to protect wild life at all times if it is to escape serious decimation and in some cases complete extinction.

This joint committee will undertake such conservation work as can better be done by the combined efforts of the three component organizations than by any one of them or by all three acting independently. Each constituent organization will continue to work on the special matters which interest it alone, but it is felt that their combined efforts will greatly assist those causes to which all three are devoted. The associated committees do not ask for funds as a new organization, to the confusion of the public, but as a joint appeal, making it possible for all patrons of the parent organizations intelligently to support their activities.

The Associated Committees are unanimous in urging:

1. That laws protecting song, insectivorous and game-birds must be kept impartially enforced.
2. That reservations and sanctuaries are needed in which all wild life may live undisturbed.
3. That all enemies of our wild life—natural and human—must be kept under control and that the game-birds so far as possible should be propagated to increase the number, or at least to fill the places of those taken.
4. That the commonwealth should provide funds from the general tax levy to purchase, maintain and administer throughout the state suitable breeding, nesting and feeding areas for birds and animals.
5. That if future generations are to enjoy those things which delight the lover of the out-of-doors, be he sportsman or bird-lover, the work of conservation must be carried on actively to insure this heritage.

The personnel of the committee is: representing the Audubon Society, Francis H. Allen, Charles B. Floyd, Mrs. Robert B. Greenough, Ralph Lawson, Robert Walcott, George C. Warren and Mrs. Sydney M. Williams; representing the Fish and Game Association, Frank W. Hallowell, Robert A. Leeson, John C. Phillips, John L. Saltonstall and John E. Thayer; representing the Federation, Gorham Brooks, Laurence B. Fletcher, Edward H. Forbush, Harris A. Reynolds and Charles L. Whittle. Mr. John L. Saltonstall is chairman of the associated committees; Laurence B. Fletcher is secretary, and George C. Warren is treasurer.

REORGANIZATION OF CHEMICAL AND SOILS WORK IN THE U. S. DEPARTMENT OF AGRICULTURE

SECRETARY JARDINE has announced that he has recommended consolidation in one unit, to be known

as the Bureau of Chemistry and Soils, of the research work in the United States Department of Agriculture on soils and fertilizers and certain of the chemical work on agricultural products at present conducted by the Bureaus of Chemistry, Soils and Plant Industry, and the placing of the regulatory work involved in the enforcement of the Federal Food and Drugs Act, the Tea Inspection Act, the Insecticide and Fungicide Act and the Naval Stores Act in another single administrative unit, to be known as the Food, Drug and Insecticide Administration. The reorganization recommended by the secretary is included in the budget for the fiscal year 1928 which has just been presented to the Congress.

The proposed reorganization is primarily for the purpose of separating work involving scientific research from the work of law enforcement and bringing together under one directing head the closely related research and other work of the department on soil science, fertilizers, etc., and in the general field of agricultural chemistry which is now scattered in three separate bureaus. The secretary states that it is highly desirable that the research work and the regulatory work be handled by separate administrative units because the growing pressure under which it is necessary to work in handling law enforcement is such as to interfere seriously with the attention that can be given to research work. Law enforcement must be handled promptly as cases arise and when both this work and scientific research are conducted by the same organization the natural tendency is to put aside the research project which is not of immediate urgent appeal but which is of far reaching importance considering the long-time future of American agriculture.

The new plan of administration is based upon the report of a group of leading agricultural scientists who, at the invitation of Secretary Jardine, submitted recommendations last summer concerning the organization of the chemical, soil and fertilizer work of the department. The secretary's advisers recommended specifically that a separation of certain of the regulatory and research work of the department be made and that the secretary "organize the research work of the present Bureau of Chemistry, the work of the offices of Soil Fertility and of Soil Bacteriology of the present Bureau of Plant Industry, and all the work of the Bureau of Soils and of the Fixed Nitrogen Research Laboratory into a single bureau."

SCIENTIFIC NOTES AND NEWS

DR. ADDISON EMERY VERRILL, for forty-two years, until he was made emeritus professor in 1907, professor of zoology at Yale University, has died, aged eighty-seven years.

PROFESSOR JACOB E. REIGHARD was tendered a banquet on December 3 in honor of his completion of forty years of teaching in the department of zoology of the University of Michigan. One hundred and thirty of his colleagues, former students and friends were in attendance.

DR. HUGH M. SMITH, formerly commissioner of the U. S. Bureau of Fisheries, has been appointed director of the newly created Bureau of Fisheries of the Siamese government.

THE medal of the American Society of Mechanical Engineers has been conferred on Professor R. A. Millikan, of the California Institute of Technology.

DR. ALBERT P. MATHEWS, Andrew Carnegie professor of biochemistry in the University of Cincinnati, has been elected a member in the Accademia dei Lincei of Rome.

PROFESSOR ANTON J. CARLSON, chairman of the department of physiology in the University of Chicago, has been elected a foreign member of the Royal Society of the Natural Sciences in Upsala.

DR. J. S. HALDANE, of Oxford University, has been presented with the gold medal of the Royal Society of Medicine. The medal was founded by a gift from the late Dr. Robert Murray Leslie, and previous recipients have been Sir Almroth Wright (in 1920) and Sir F. Gowland Hopkins (in 1923).

SIR ERNEST RUTHERFORD, Professor H. A. Lorentz and Dr. H. LeChatelier have been elected foreign members of the Polish Academy of Sciences.

THE silver medal of the Zoological Society of London has been awarded to Captain H. C. Brocklehurst, the game warden of the Sudan, in recognition of his services to the society, and for the active part which he has taken in the preservation of the wild fauna of that part of Africa.

PRESENTATION of the Helen Culver gold medal of the Geographical Society of Chicago was made to Commander Richard E. Byrd on November 15, preceding his lecture on the conquest of the North Pole by air. Dr. J. Paul Goode made the presentation.

LINCOLN ELLSWORTH, codirector with Roald Amundsen in the flight of the dirigible *Norge* from Spitzbergen across the North Pole to Alaska, has been decorated with the grand cross of the Royal Order of St. Olav by King Haakon.

KNUD RASMUSSEN, Danish Arctic explorer, has been made an honorary life member of the National Geographic Society.

THE Alvarenga prize of the College of Physicians of Philadelphia has been awarded this year to Drs.

P. S. Pelouze and Frederick S. Schofield for an essay entitled "The Gonophage."

PROFESSOR P. H. M. P. BRINTON, of the University of Minnesota, has announced that he plans to retire from university work at the end of the present academic year, in order to have all his time available for his own researches. He expects to move to Tucson, Arizona, where he will build a private laboratory for the further study of the chemistry of the rare earths.

JOHN L. CRAWFORD, Danvers, has been elected president of the Northeastern Section of the American Society of Chemical Engineers and Charles W. Conquest, Fairhaven, secretary.

DR. MARSTON T. BOGERT, professor of chemistry at Columbia University, has been appointed chairman of an advisory committee to the color laboratory of the Bureau of Chemistry, U. S. Department of Agriculture.

CHARLES E. SKINNER has been elected chairman and Charles Rufus Harte vice-chairman of the Engineering Standards Committee for 1927.

DR. C. B. JOLLIFFE, of the radio laboratory of the U. S. Bureau of Standards, has resigned to accept a position in the research department of the Buckeye Incubator Company, Springfield, Ohio.

DR. ERNEST LITTLE, professor of analytical chemistry in Rutgers University, has been granted a partial leave of absence to become dean of the New Jersey College of Pharmacy.

J. M. TRUEMAN, professor of animal husbandry, Truro Agricultural College, has been appointed director of agricultural extension in the Nova Scotia Department of Agriculture.

PROFESSOR VLADIMIR MORAVEK, who has been carrying on researches in permeability and the action of artificial cells with Dr. D. T. MacDougal, laboratory for plant physiology of the Carnegie Institution of Washington, for several months, returns to the University of Brno, of which he is a member, at the end of December.

DR. A. F. LEBEDEFF, professor of agriculture and director of the plant-breeding station at the University of Rostoff, south Russia, has been in the United States visiting agricultural experiment stations for the past few months.

DR. EMERSON MEGRAIL, assistant professor of hygiene and bacteriology at Western Reserve University, has been granted a seven months' leave of absence, effective on December 1, to work at the Lister Institute, London, under the direction of Sir J. C. G. Ledingham.

PROFESSOR S. A. MITCHELL, director of the Leander McCormick Observatory, will lead an expedition to observe the total eclipse of the sun in Norway on June 29, 1927. According to *Popular Astronomy* the rector and visitors of the University of Virginia have announced a gift from Mr. John Armstrong Chaloner, of Virginia, to finance the expedition.

THE school of chemistry and physics of the Pennsylvania State College announces a series of five lectures on colloid dynamics by Victor Cofman, of the Research Laboratory of Armour and Company. The lectures will be held in the lecture room of the physics building, daily, from January 10 to 14. They will be illustrated by lantern slides and by demonstration experiments.

DR. J. H. VAN VLECK, of the University of Minnesota, recently gave four lectures on the "New Quantum Mechanics" to the graduate students of the department of physics at the University of Iowa.

LIEUTENANT-COMMANDER EDWARD H. SMITH, U. S. Coast Guard, oceanographer of the International Ice Patrol, will give five lectures on physical oceanography at Clark University, from January 10 to 14.

DR. HARLAN T. STETSON, assistant professor of astronomy at Harvard University, lectured at the Brooklyn Institute of Arts and Sciences on November 13 on "Some Results of Recent Eclipses of the Sun."

DR. JAMES A. TOBEY, of New York, lectured on public health law at the Harvard University School of Public Health on December 7 and 9.

DR. W. MANSFIELD CLARK, chief of the division of chemistry, United States Public Health Service, delivered a lecture on "A New Approach to the Study of Oxidation-Reduction in the Living Cell," at the University of Wisconsin, on November 3.

DR. COLIN G. FINK, professor of electrochemistry in Columbia University, gave the Alfred Waters Procter lecture at the Brooklyn Institute of Arts and Sciences on the evening of November 20. Dr. Fink chose as his subject "The Electrochemical Restoration of Ancient Bronzes and other Ancient Metal Objects of Art." On December 1 Dr. Fink addressed the Alpha Chapter of the honorary engineering fraternity, Tau Beta Pi, on "Recent Advances in Electrochemistry." At the coming meeting of the North Jersey section of the American Chemical Society he will give an illustrated lecture on "Chromium, a Metal of many Uses." The following evening, December 14, he will address the Rhode Island section of the American Chemical Society on "Recent Advances in Electrochemistry."

ON November 27 Professor A. Brooker Klugh, of

the department of biology, Queen's University, delivered an address to the Royal Canadian Institute on the subject "Nature Photography." On December 2, Dr. George E. Vincent, president of the Rockefeller Foundation, addressed the institute on "The Health of the World and the League of Nations."

DR. A. V. HILL, Foulerton research professor of the Royal Society, London, will give a series of eight lectures under the auspices of the Lowell Institute, Boston, on "Living Machinery," on Mondays and Thursdays, at five o'clock in the afternoons, beginning March 7.

A PORTRAIT of Michael Faraday, and a reproduction of the portrait of Lord Kelvin painted by Herkomer for the Institution of Civil Engineers, both by Mr. George Harcourt, were shown in the lecture theater of the Institution of Electrical Engineers in the positions allotted to them at the meeting on December 2. After introductory remarks by the president, Mr. Harcourt's portrait of Faraday was presented to the institution by Mr. Sydney Evershed.

A BUST of the late Carl E. Akeley, animal sculptor and explorer, will be offered to the American Museum of Natural History with which he was so long identified by his friend, Harold P. Erskine, American sculptor. Mr. Erskine made the bust two years ago.

DR. DANIEL CARHART, professor emeritus of civil engineering at the University of Pittsburgh, died on December 8, aged eighty-seven years.

DR. SAMUEL GILBERT WEBBER, formerly professor of neurology in Tufts Medical School, Boston, died on December 5, aged eighty-eight years.

PROFESSOR REGINALD SOMERS COCKS, of Tulane University of Louisiana, died on November 21. A correspondent writes that he was born in Worcester, England, August 31, 1863. In 1889 he received the degree of M.A. from Trinity College, Cambridge, with first honors in classics. He was professor of botany in the State University of Louisiana from 1906 to 1907. In February of that year he was called to Tulane University to fill the newly created Richardson chair of botany. For over twenty years he carried on investigations with the flora of Louisiana and the adjoining states. His special field of work, however, was with the trees of the South. He discovered nearly fifty trees hitherto unknown. A great deal of material was left unpublished at his death, and a large private collection of plants made by him is now in the botanical laboratories of Tulane University.

THE Nobel prizes for physics, chemistry and literature were presented by King Gustav of Sweden on December 10. Those who personally received their medals and diplomas were Professor James Franck, University of Göttingen, and Professor Gustav Hertz, of the University of Halle, who shared the Nobel prize for physics for 1925; Professor Jean B. Perrin, of the University of Paris, the physics prize for 1926; Dr. Richard Zsigmondy, of the University of Göttingen, the chemistry prize for 1925, and Professor Theodore Svedberg, of the University of Upsala, the chemistry prize for 1926. After the ceremony the Nobel prize committee gave a banquet in honor of the recipients.

THE Fifth International Congress of Genetics is to be held in Berlin from September 11 to 18, 1927, immediately following the Zoological Congress in Budapest. According to *Eugenical News*, the mornings are to be kept for general sessions in which an eminent investigator will treat some outstanding theme in genetics. The rest of the morning program will be an invitational one, with discussions. In the afternoons there will be special sections in which comprehensive papers and lectures will be heard.

THERE has recently been founded in Chili the Sociedad Chilena de Historia Natural. This society includes the working naturalists in Chili and will be devoted to natural history in all its branches. The first directorate is composed as follows: *President*, Dr. Carlos E. Porter, director of the museum and laboratory of applied zoology; *vice-president*, Professor Francisco Fuentes, chief of Phanerogamia, National Museum; *secretary*, Sr. Gaulterio Looser, in charge of anthropology, National Museum; *prosecretary*, Professor Gilberto Mantero, librarian and secretary of the National Museum; *directors*, Professor Marcial R. Espinosa, in charge of cryptogamic botany, National Museum; Professor Miguel R. Machado, chief of section of geology, National Museum; Fr. Flaminio Ruir, professor in College of San Pedro Nolasco. The official organ of publication will be the *Revista Chilena de Historia Natural* under the editorship of Dr. Carlos E. Porter.

THE annual meeting of the West Virginia Academy of Science was held at Bethany College, November 26 and 27.

A CONFERENCE was held in Rochester on December 9 on the use of motion pictures for instruction in the science of medicine, surgery and public health. At the close of the conference, Dr. Franklin Martin, of Chicago, director general of the American College of Surgeons, announced that steps to be taken in preliminary experiments with surgical films had been left to himself and George Eastman, chairman of the board of the Eastman Kodak Company. Mr. Eastman, as spokesman for the company, offered to under-

take the expenditure of conducting the experiments in so far as they relate to equipping an operating room at the University of Rochester School of Medicine and furnishing the technical photographic service.

A SCIENTIFIC exhibition was recently held at Halifax, Nova Scotia, under the auspices of the Nova Scotia Institute of Science. More than a hundred working experiments, besides numerous exhibits, in the physical, biological and medical sciences were shown by the science departments of Dalhousie University, the N. S. Technical College and the Atlantic Experimental Station. The exhibition was in the nature of an experiment. Its success was demonstrated by the crowds that thronged the building during the two evenings and one afternoon that it was open. It was estimated that eight per cent. of the population of Halifax was in attendance and many were unable to gain admittance.

THE Rockefeller Foundation has offered to appropriate to the Bernice P. Bishop Museum of Honolulu for Polynesian anthropological research sums amounting to $50,000 over a period of five years, providing that an equal amount be raised for the same purpose from other sources.

THE *Journal* of the American Medical Association states that one entire floor of the new St. Louis Maternity Hospital will be devoted to research laboratories for full-time workers, this being made possible by a gift of $650,000 from the Rockefeller Foundation, provided the entire sum is used on research work in obstetrics. The new hospital building will be completed in June, 1927, and will cost $750,000. The maternity hospital is now a unit of the Washington University group of hospitals.

J. F. LINCOLN, vice-president of the Lincoln Electric Company, Cleveland, has given the sum of $17,500 to the American Society of Mechanical Engineers to be used next year in prizes for the best papers on arc welding, submitted in an international competition. The first prize will be $10,000, the second $5,000 and the third $2,500.

AT a meeting of the Research Committee of the Oyster Growers' and Dealers' Association of North America, held on December 5 at the offices of the Broadway Association, it was decided to raise $10,000 for scientific research in the oyster industry. Howard W. Beach, of New Haven, is chairman of the committee.

M. FERDINAND CANU, of Versailles, France, has presented to the Smithsonian Institution his private collection of fossil invertebrates from France and particularly the Paris basin, which he has spent fifty years in gathering. M. Canu made the gift through Dr. R. S. Bassler, paleontologist of the National Museum, with whom he has collaborated extensively since 1910 in working out geological horizons for the Atlantic and Gulf States. This work was undertaken by Dr. Bassler and M. Canu at the request of the U. S. Geological Survey.

HUNTER M. MERIWETHER recently made a gift of his 50-acre suburban estate "Mericourt," of Clarksville, Tenn., to the University of Tennessee, to be used as an agricultural experiment station, and immediate possession of the property has been given the university. The estate is valued at over $50,000.

GENERAL adoption of the policies outlined for the rehabilitation of the museum in Letchworth State Park, New York, are expected soon, according to *Museum News*. Dr. Charles C. Adams, director of the New York State Museum, and Arthur C. Parker, director of the Rochester Municipal Museum, who were appointed a committee, have submitted a detailed series of plans to the American Scenic and Historic Preservation Society, which has the immediate supervision of the park. The plans, which are now before the society and which will probably be formally adopted soon, provide for field stations and shelter buildings to be scattered through the park. These will enclose suitable signs and outdoor exhibits placed in proximity to the outstanding natural features, for which the park is noted.

THE Department of the Interior has announced the setting aside of an area of about seven square miles in the High Sierra country of Yosemite National Park in California as a perpetual reservation in which the flora and fauna will always be left in their primitive state. The purpose in doing so, it is stated, is to afford an opportunity for the study of plants, animals and geologic and other natural features under primitive conditions.

LOUISIANA has recently added its fifth wild life sanctuary—a tract of 81,000 acres—through a contract between the state and the Singer Manufacturing Company. A huge tract of hardwood is owned by the Singer Company in Madison Parish. In return for fire protection for this timber, to be given by the state, the area has been made a preserve, game wardens will be installed and the entire area fenced and posted. The contract has a life of ten years, renewable for a like period.

THIRTY biologists residing in or near Tucson, Arizona, attended a dinner at the Old Pueblo Club, on November 18, for the purpose of gaining better contacts with their fellow workers. Dr. Forrest

Shreve, of the Carnegie Institution of Washington, spoke on the history and work of the Desert Laboratory at Tucson. The meeting was attended by representatives of the Desert Laboratory of the Carnegie Institution of Washington, the Boyce Thompson Institute of Plant Research, Southwestern Arboretum, U. S. Department of Agriculture, Biological Survey of the Bureau of Entomology and Forest Service, Arizona Agricultural Experiment Station and the department of biology of the University of Arizona. Meetings are to be held at frequent intervals in the future, but formal organization was considered inadvisable. Dr. J. G. Brown, Dr. Forrest Shreve and Mr. W. G. McGinnies were named as a committee to arrange for future meetings.

EFFORTS of the last two years have culminated in an agreement whereby the *Index Medicus,* published since 1879 under various auspices, and the *Quarterly Cumulative Index,* published since 1916 by the American Medical Association, will be combined and issued as a single publication to be known as the *Quarterly Cumulative Index Medicus.* The new bibliographic principles, including primarily classification of subjects and authors in one alphabet, will be maintained in the new publication. It will, moreover, include the extensive bibliographic material of the library of the Surgeon-General's Office in Washington, D. C., covering, instead of the three hundred periodicals to which the *Quarterly Cumulative Index* was formerly limited, practically the entire medical literature of the world. The publication will be printed on the presses of the American Medical Association. The Carnegie Institution, which has in recent years supported the *Index Medicus,* will bear a portion of the expense. The first issue of the new periodical will appear in April, 1927, and will cover the literature received during the first three months of that year.

Industrial and Engineering Chemistry states that in order to encourage work in the field of synthetic rubber, the Presidium of the Supreme Council of National Economy of the Union of Socialist Soviet Republics announces two prizes for processes for the preparation of synthetic rubber. Two prizes are offered for the best methods found to satisfy the conditions of the contest: a first prize of $50,000 and a second prize of $25,000. All contestants must present complete descriptions and reports of their processes, including 2 kgs of the synthetic rubber preparation, not later than January 1, 1928.

UNIVERSITY AND EDUCATIONAL NOTES

MRS. ISAAC H. CLOTHIER, of Wynnewood, has given Swarthmore College $100,000 towards the erection of an auditorium or other memorial to her husband, who was for forty-eight years a member of the board of managers of the college.

JOHN D. ROCKEFELLER, JR., has made a gift of $150,000 to Princeton University for the purpose of enlarging the university gymnasium.

COLONEL R. W. LEONARD, of St. Catharine's, Ontario, has made a gift of $35,000 to Dalhousie University, Halifax.

BROWN UNIVERSITY has completed plans and will proceed with the erection of its proposed new chemical laboratory, which is expected to cost about $100,000 with equipment. A contract for the building has been let.

APPOINTMENTS of former fellows in medicine of the National Research Council to academic posts have been announced as follows: Dr. Louis Leiter, assistant professor of medicine, University of Chicago. Dr. Leiter is at present on leave of absence in Munich. Dr. William H. Chambers, instructor in physiology, Yale University. Dr. Jay McLean, assistant attending surgeon and lecturer in surgery, the Polyclinic Hospital of New York City. Dr. Clarence A. Mills, associate professor of medicine, Peking Union Medical College. Dr. Bernhard Steinberg, director of laboratories and research, Toledo Hospital, Ohio. Dr. Charles S. Woodall, physician to the Walter E. Fernald State School, Waverley, Massachusetts.

DR. FREDERICK W. OWENS, assistant professor of mathematics at Cornell University, has been appointed head of the department of mathematics at Pennsylvania State College.

DISCUSSION AND CORRESPONDENCE

SAND FLOTATION IN NATURE

IN connection with the articles on sand flotation which have appeared in SCIENCE during 1926 (63: 405–406, 571; 64: 138), it may be interesting to note that I have observed this phenomenon on Douglas Lake in Cheboygan County, Michigan, on more than a dozen days during each summer for the past fifteen years. The best explanation in these cases is that given by Edwin H. Hall (SCIENCE 63: 571) that at a time when the shore is dry, ripples of water lapping dry sand take down with them a certain amount of sand which remains in the surface film until the particles are entirely wetted, whereupon they sink. At Douglas Lake it has always been noted at times when there was an offshore wind, but never when this wind was strong; usually only when the wind is hardly more than perceptible, if at all. The ripples that

pick up the sand may be caused by any number of disturbances such as a fish leaping from the water, or a bird or insect striking the water, or rowing or other human disturbances. The patches are usually but two or three centimeters in diameter, but occasionally may reach as much as twenty cm. The larger patches sometimes are due to union of smaller ones, as has been observed. In a very gentle breeze these patches may go out three or four hundred meters into the lake before they sink. Any disturbance of the patches such as touching them causes all the grains to sink immediately.

At no time at Douglas Lake have any of these patches of floating sand had their origin during a time of high wind. However, in two instances in my experience the sand flotation has been the result of sand being blown onto the water. Each of these two cases has been when a strong wind was forced to blow up over a dune, the face of which was cut into by a body of water. Some of the swiftly moving sand hitting the water at a very acute angle remained in the surface film. In the case at Lake Michigan the amount of sand that remained on the surface was sufficient to interfere with the enjoyment of swimming when one opened his mouth at the surface of the water. While most of the sand went to the bottom very shortly, some of it was still on the lake as much as fifteen meters out from the shore; beyond that, however, the wind could hit the water and disturb it sufficiently to cause no more sand to remain in the surface film. In the second case the sand was blown into the Kansas River. That that hit the river where the current was boiling immediately sank to the bottom. Close to the shore, however, where the water was not obviously disturbed, although moving, a fair quantity of the sand remained in the surface film. The sand that remained in the surface film floated down stream close to the lee bank, which was also on the side opposite from the main current. Although constantly diminished in quantity, nevertheless some small patches were still visible a kilometer down the stream. At this place the wind had full sweep of the river, which disturbance ended the flotation.

FRANK C. GATES
KANSAS STATE AGRICULTURAL COLLEGE

THE NEIGHBORS

IN SCIENCE for November 19 (page 497) it is stated that an Association of Professional Astronomers will meet in New Haven in December. There is no such organization nor any need of one. Some astronomers on the Atlantic coast have, however, been carrying out since 1920 a plan which has proved so useful that possibly other groups (in other localities or in other sciences) may wish to make the same experiment. Beginning in June, 1920, a number of us whose chief interest is research have been meeting informally about four times a year for the purpose of exchanging ideas and getting the benefit of the collective wisdom and experience of the whole group in the solution of our individual problems. But it is of the essence of this idea that there should be no organization; there is no constitution, no rules of any kind, no officers, no fixed list of members and no dues. We have even lacked a name until very recently, when we have begun to call ourselves the Neighbors. At first we met in New York City, but this was found to be unnecessarily expensive, and for some of the members it was somewhat inconvenient. We now meet at New Haven because it is centrally located and because the courtesies extended to us by two clubs in the city make the meetings much more pleasant than they could be in a busy metropolitan hotel. These meetings begin on Friday afternoon and break up somewhat gradually, most of the out-of-town members leaving on Saturday, a few sometimes remaining over until Sunday. We spend all this time together except the few hours that must be wasted in sleep. It is understood that no one is to attempt to read a paper, but during this day or two there is much astronomy in the air; some of it is very much so, for it has gotten to be a tradition with us that our statements need not be well considered. Many a fascinating theory has seen the light of day, flourished and passed on, all in the space of twenty minutes.

In a small group like this, meeting so frequently, our knowledge of each other has gotten to be intimate and has given rise to a network of friendships which in themselves, aside from any questions of scientific results, justify the existence of the Neighbors.

FRANK SCHLESINGER

NEW HAVEN,
NOVEMBER 29, 1926

FIELD TRIPS IN GEOGRAPHY

TWO recent notes in SCIENCE for June 18 and October 22 have shown the clear appreciation felt among geologists for active field work by their students during the prosecution of their studies. It may be interesting, therefore, to publish here the terms of a travel scholarship recently established in the department of geology and geography at the University of Wisconsin. In this connection, it should be added that the ideal toward which the department is striving is that each student who majors in geography be required to spend fourteen days in the field at least 500 miles away from Madison, during the spring recess of the year in which he takes his degree. The announcement below gives briefly the plan which the student is ex-

pected to follow. Eventually it is hoped that sufficient financial aid will be available so that every capable student who is unable to cover his own expenses will be met half-way with a scholarship of the type described.

The terms of the scholarship are as follows:

1. This scholarship is established to promote a keener appreciation of the importance of intelligent travel in geographical study.
2. It is open to all students, both men and women, undergraduate and graduate, who are majoring in geography.
3. The selection of the scholar will be made at the end of the first semester and will depend upon the quality of work performed during the first semester in all courses, as well as upon his general attitude and personal initiative along geographical lines.
4. The candidates will submit all of their notes, lecture notes, laboratory note books, examination and quiz books, term papers as well as those of lesser importance, and also any other material prepared by them in the prosecution of their studies.
5. The scholarship is for one half the expenses of the trip outlined below, up to $100, and the scholar agrees to provide a like sum.
6. The winner of the scholarship will register for course Geography 122 for two credits at the beginning of the second semester. The requirements for this course will be met by this trip about to be described, and the subsequent report.
7. The trip.
   a. The scholar agrees to travel for at least 10, but preferably for 14 days during the Easter holidays to some point at least 500 miles from Madison, as for example to Buffalo, Pittsburgh, New York, Boston, Washington, Savannah, Tampa, Atlanta, New Orleans, Houston, Denver, etc.
   b. The scholar will endeavor to make an intelligent visit to, rather than a research investigation of, the place visited.
   c. He will visit and study as far as practicable at least one feature or point of physiographic or geologic interest, and in addition acquaint himself with the regional physiography of the area traversed.
   d. He will visit at least one extractive industry peculiar to the locality, such as lumbering operations, turpentine production, salt production, some form of agriculture or mining, or quarrying. This will probably demand two or three days in the field.
   e. He will visit, with some attention to details, at least one manufacturing industry peculiar to the locality, such as smelting, printing, spinning, glass making, locomotive or ship building, or the fabrication of some article of commerce.
   f. He will visit at least one institution of a public character such as a museum or institution of learning.
   g. He will familiarize himself with the general plan of one large city, its physiographic setting, the street system, and the arrangement of its different sections, residential, manufacturing, business, transportational and recreational.
8. Upon his return the scholar will prepare a finished report along approved geographical lines, illustrated if possible to fulfill the requirements of Geography 122.

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UNIVERSITY OF WISCONSIN

BREVITY AT BOTANICAL BANQUETS

THIS summer's meeting at Ithaca almost doubled for the year 1926 the opportunities for botanical speech-making in the United States. It may then be not inappropriate or impertinent to discuss the length desirable in such addresses.

Reference is, of course, not here made to papers of a highly specialized character before the various sections of the different societies. These sections are so numerous and so small that no one feels any obligation to attend and each feels perfectly free to leave whenever he chooses. The speaker is then under no obligation to conserve the time of his audience, if any. His position is somewhat like that of an author of a book, who may suit himself or his publisher as to its length, since the weary reader may easily lay the book aside or throw it into the fire.

The obligation for brevity in personal conversation is slight also, for the bored listener can usually escape, either by tact or violence. Whoever addresses an assembly, however, especially one to which people come partly for social reasons and where the auditors feel under compulsion to hear the speaker through, is under a definite obligation to be brief. Not every speaker, of course, can attain the brevity or awaken the enthusiasm aroused by Dr. Britton vicariously in his presidential address at Toronto, but a short speech may be, indeed often is, a good speech.

Brevity in speech, even serious speech, is possible. Lincoln's Gettysburg address contains but 266 words. Paul's speech on Mars Hill contains, in the English translation, exactly the same number. Gamaliel saved the apostles in a speech of 139 words. Franklin, returning to this country in 1783 after his long and distinguished service in Europe, received expressions of congratulation and gratitude from various organizations. His replies to these addresses rarely exceeded 150 words, and one of the most frequently quoted is scarcely one hundred.

Shakespeare appears to have had a very definite conception of what an audience will stand and enjoy.

Examination of his best known plays shows strict regard for brevity in all scenes in which an audience of even a few people is present. In the court scene in the "Merchant of Venice," the Duke's longest speech is 135 words, Antonio's 149, Shylock's longest 229, Portia's 173. In situations which call for longer speeches, Shakespeare is careful to see that they are broken into short units. In "Hamlet," the recitation given in part by Hamlet and in part by the First Player, only 435 words in all, is twice interrupted by Polonius, once with the remark, "This is too long." Brutus' speech, after the assassination, in "Julius Caesar," is but 348 words in length, and is twice interrupted, the longest unit being 235 words. Mark Anthony follows with a speech of less than eleven hundred words, which occupies, as delivered by Mr. John Alexander, just eleven minutes. Yet it is interrupted a dozen times and the longest fragments are but little over 250 words in length. Nowhere, in these three plays at least, does Shakespeare permit a character to address an audience, without interruption, for more than three hundred words.

Since politely suggested "time limits" have not always controlled our after-dinner speakers, is not the advisability of an absolute rule forbidding talks of more than three hundred words indicated? Our speakers could not urge that their messages are too important for such brevity. Who among them chooses a theme more lofty than Paul's, is weighed with responsibilities graver than Lincoln's or brings to us a wealth of experience greater than Franklin's? Nor could they maintain in extenuation of their prolixity that these great men had many opportunities for speech-making. Gamaliel's immortality was gained by one speech, which bears the final stamp of approval, "And they agreed unto him."

Possibly, however, so exact a rule might be construed as a tyrannical limitation of Anglo-Saxon freedom of speech; in which case it might be possible to print on menu cards at all dinners for which formal talks are planned the following instructions for toastmasters and after-dinner speakers of all ages taken from the book of Ecclesiasticus. These directions occupy, it will be noted, in the English translation just 112 words.

> Have they made thee ruler of a feast? be not lifted up, be thou among them as one of them; take thought for them, and so sit down. And when thou hast done all thy office, take thy place, that thou mayest be gladdened on their account, and receive a crown for thy well ordering. Speak, thou that art the elder, for it becometh thee, but with sound knowledge: . . . and display not thy wisdom out of season.
>
> Speak, young man, if there be need of thee; yet scarcely if thou be twice asked: sum up thy speech, many things in few words; be as one that knoweth and yet holdeth his tongue.

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SCIENTIFIC BOOKS

An Introduction to Mathematical Probability. By JULIAN L. COOLIDGE. Oxford, Clarendon Press, 1925. xi + 215 pp.

IT is rare that one finds mathematics presented at once attractively and with the mathematical spirit closely guarded, but here is a book exposing many difficult parts of the theory of probability which is also in some sense literature. Its charm seems to be due specially to the fact that it has individuality. There is humor, too, and of an alluring quality, but it is not chiefly the author's sense of humor which holds the attention. Almost every paragraph and every demonstration bears the imprint of his own method of thinking. As a rule the theorems and the demonstrations are not essentially new, and only a few of them are selected from the author's earlier publications, but none the less they possess all the inspirational quality that usually springs only from true originality. The manner in which the story is told is all his own.

The thoroughness with which he has absorbed the ideas underlying his theory before expounding it has some disadvantages, to be sure. It makes the book less good for reference. More nearly standard notation and language would make much of it clearer to him who would read only a chapter here and there, but this is perhaps impossible and certainly quite unnatural if one starts out to put the whole theory in his own words and symbols. More numerical illustrations would be of service, however. To one who reads the whole the notation and language become so familiar that a newly stated theorem immediately has a meaning, but many readers do not approach a new theorem in that orderly fashion. They would like first to jump it, land on an illustration which would contain the essential idea, and then go back and look carefully at the theorem if it should seem interesting. In short, this book is, as it purports to be, chiefly a text for the student who will study it all. It gives the mathematical basis of the theory of probability and of its applications to various fields. In no one of these applications is there sufficient material to satisfy the specialist, only enough to give the mathematical reader an insight into its fundamental concepts. The specialist ought to study it because he ought to know the foundations on which his science rests, in so far as it may be said to rest on any, but

in doing so he may be aware of injured feelings because the possibilities of his subject are not exploited. As an illustration, the application to statistics hardly mentions frequency distributions, and under the theory of sampling one does not find the probable error of a frequency—which is a rather fundamental notion.

An unfortunate mistake, already noted by other reviewers, needs the reader's attention. Theorem 2 of page 36 should read "minimum" instead of "maximum." The error is due to an incorrectly turned inequality sign on the line just preceding, and the change invalidates Coolidge's proof of the Bernoulli theorem which follows. As it stands, Theorem 2 is proved incorrect, not proved correct, as the author states, by the expression for the approximate value of a zero discrepancy (9) on page 42; for the denominator of (9) is a maximum when p equals one half.

The table of contents indicates fairly the scope: meaning and elementary principles of probability, Bernoulli's theorem, mean value and dispersion, geometrical probability, probability of causes, errors of observation in one and in many variables, indirect observations, statistical theory of gases, life insurance and some tables.

The first chapter contains a thoughtful discussion of the basic definition of probability, and it is enormously important that one's concept of this notion be made precise at the outset. The author shows clearly that, from the practical point of view, one needs two assumptions, either of which might be taken as a definition, the one containing the limit idea and the other the relative frequency idea. In general the arguments here are searching, though occasionally something is wanting, as in the following case (page 8): "We make this affirmation (that a spinning coin is equally likely to turn up head or tail) only upon the hypothesis that it is . . . nearly homogeneous, with the center of gravity near the middle, while the method of spinning is such that it had no tendency to favor the one face at the expense of the other." We certainly must go farther and define what is meant by "nearly" homogeneous, and "near" the middle. In fact we do not make the affirmation that the probability of head is one half in case the coin is exactly homogeneous, exactly symmetrical, and spun with no bias whatsoever; for then it would remain on edge, "and the boys would have to study." Also, the author does not here sufficiently insist that fundamental to the concept of probability is the correlation of *two* events; commonly called cause and event, or universe and individual. Probability is the relative frequency with which the individual is found in the universe. To insist on this duality is to be able to point out with better emphasis the sad state of Bayes' theorem, and so-called *à posteriori* probability, as will be shown in a moment. Coolidge says, in concluding his Chapter VI on this theorem: "We take it with a sigh, as the only thing available under the circumstances. 'Steyning tuk him for the reason the thief tuk the hot stove—bekaze there was nothing else that season.'" The reviewer believes that Bayes' theorem does not have a meaning in the practical cases to which it is applied, and that in the artificial cases for which it does have a meaning it is really not a new or different kind of probability at all and would better not be handled as such. Coolidge almost says as much himself. Indeed, after reading his earlier remarks one wonders whether after all he did think Bayes as good as a hot stove or whether he took him for the literary allusion. But, unfortunately, this pleasant hypothesis has to be abandoned on reading further, for it is discovered that he is to be used in deriving the so-called Gaussian law. For this demonstration Coolidge rejects the idea of fundamental or elementary errors, which was exploited by LaPlace, and originally due to DeMoivre—antedating Gauss by half a century—because he does not believe they actually exist. Admittedly there is difficulty about this hypothesis, but one does not rid oneself of difficult assumption when one forsakes elementary error and cleaves to Bayes. That is to jump from the frying pan into the hot stove. Let us suppose a concrete case. The length of this room is to be measured a million times. What will be the frequency distribution of the measurements? That is the problem Coolidge has before him. Will it be the normal ("Gaussian") law? In order to prove that it will, he talks about the probability that the true value (which is 20.00 feet) shall take on a certain value x when a certain set of ten measurements has a mean value 20.10 feet. Remember our insistence that probability, to have a meaning, involves two events, the universe, and the individual. If the true value is to be the individual, what is to be the universe in this case? One may think of a universe constructed as follows. Imagine 100,000 equal observers to take ten measurements each. There results 100,000 means, and some of them have the value 20.10 feet. This latter sub-group of means is the universe. The probability that the true value is x must now be the relative frequency in this universe with which the true value is x. But this is nonsense; at best one must say that this probability is zero unless x is 20.00 feet. The true value is a constant, and does not depend on the observations. Of course, one may construct a case, as in the proof of Bayes' theorem, where a meaning for the probability of the true value being x does exist. One may begin by supposing 100,000 different observers, each observing one of a set of many rooms, chosen in some manner; but

this is quite artificial and has no relation to the problem before us. We are interested in the distribution of many measurements of one room, not in the distribution of many measurements of several rooms. Further, with regard to the difficulties with the hypothesis of elementary errors, it certainly is true that elementary errors do exist in some cases. For example, the error made when a long range gun is fired is a function, perhaps approximately linear, of errors made by the gunner, in estimating elevation, direction and force of wind, temperature and composition of powder, etc. We do not wish this hypothesis to be available in all cases of physical measurements, for it is not true that all cases give a normal distribution, and we do not wish to be put in the embarrassing position of having to prove too much. May it not happen that the question of the observance of this law in a given case does in reality depend on the applicability of just this hypothesis?

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SPECIAL ARTICLES

THE OPAH OR MOONFISH, LAMPRIS LUNA, ON THE WEST COAST OF FLORIDA

LATE in July, 1926, one of my former students, Dr. Louise M. Perry, of Asheville, N. C., called at my office and showed me a pencil sketch of a fish which I at once recognized as *Lampris luna*. On showing her the colored figure in Couch's "British Fishes"[1] and reading the description in Jordan and Evermann's "Fishes of North and Middle America,"[2] Dr. Perry declared this to be the fish in question.

This fish came ashore on the bay side of Captiva Island, west shore of Florida, during a heavy southwesterly blow, in the period of full moon during the first week in May, 1926. Dr. Perry has a winter home on the waters of Charlotte Harbor, which is separated from the Gulf of Mexico by Captiva, Sanibel and other islands, and being an ardent fisherman and student of natural history, is particularly on the lookout for unusual specimens. None of the local fishermen on Captiva and Sanibel Islands, the "oldest inhabitant," nor the local taxidermist (who for many years has been mounting specimens for sportsmen in these localities) had any knowledge of the fish. Fortunately Dr. Perry made a careful sketch of the fish and asked for its identification.

This fine specimen was carefully mounted and is in the collection of Dr. Franklin K. Miles, of Fort Myers, Florida. It and the cast in the U. S. National Museum, presently to be referred to, are the only mounted specimens on record in the new world.

Dr. Perry writes that the fish could not have been dead long before she examined it since "the brilliant red and silver of its fins and body were still undimmed." The fish was four feet long between perpendiculars, and weighed 125 pounds. Dissection showed its stomach to be full of the small clam, *Donax variabilis*. Since the opah is commonly reckoned to be a pelagic fish this is very interesting, for it shows that it had been feeding in shallow water—*Donax* being a shallow water dweller. So far as I know there are but two other references to the food of *Lampris*. Cuvier and Valenciennes[3] dissected a two and five tenths foot specimen taken at Marseilles which had in its stomach a large number of the beaks of small cephalopods and also remains of rhizostomous jellyfishes. Later Lowe[4] dissected several Madeiran specimens. In one of these (three feet, four and a half inches long) he found that "the oesophagus was filled with half-decomposed remains of the softer-coated isopodous Crustaceæ (sea woodlice)"; in another (three feet long) "both the oesophagus and stomach were filled with various small soft-coated Crustaceæ, and traces of remains of fish."

This seems to be the fifth recorded opah from the waters of North America. David Starr Jordan, under date of October 26, 1888,[5] reports the capture on the Grand Banks of Newfoundland of a five-foot specimen. This was based on a description and figure sent him by Everett Smith, of Portland, Maine. In *Forest and Stream* (1893, Vol. 41, p. 293), Dr. R. W. Shufeldt records the capture of a specimen on Le Have Bank in latitude 42° 49′ N. and longitude 63° N. This fish was in such fine condition that a cast was made and Shufeldt's article is illustrated by a figure of this fine cast, which shows all the fins covered with dots.

Goode and Bean[6] describe this same fish and figure it without the spots. They say further that "it has been reported from off Newfoundland, Nova Scotia (?), and Maine," but give no records. B. W. Evermann in 1896[7] puts on record a specimen taken at Monterey, California. Jordan and Evermann (1896) describe this Monterey specimen and add that it has been "taken off Newfoundland, Maine, and Cuba, also at Monterey and other places in Califor-

[1] Vol. II, 1863, to face page 133.
[2] Vol. I, 1896, p. 954.
[3] "Histoire Naturelle des Poissons," Vol. 10, 1835, pp. 39–60.
[4] "Fishes of Madeira," London, 1843–60, pp. 27–35.
[5] Bull. U. S. Fish Commission for 1887, 1889, Vol. 7, p. 202.
[6] "Oceanic Ichthyology," 1895, p. 223.
[7] "Recreation," 1896, Vol. 4, p. 41.

nia," but give no specific records. However, they say in a footnote that they had a drawing and description of a specimen taken at Sable Island, off Halifax, in 1846 by James Farquahar. The Florida specimen herein referred to gives a new faunal locality and ties up with its reputed occurrence in Cuban waters. The Cuban record I have been unable to verify. Poey makes no mention of it.

On the other side, it is not particularly uncommon. Lowe noted that it was by no means rare in the markets of Madeira, where it was a much-prized article of food. Cuvier and Valenciennes had specimens from the Mediterranean (as had Risso) and from the Gulf of Gascony. Numerous specimens have come ashore on the coasts of the British Isles, particularly in Scotland, and on the Norwegian coast. Indeed Couch affirms that it was recorded in Norway by Peder Claussen as early as 1632. In the Pacific it has been taken at Honolulu and in Japanese waters in the north and in New Zealand and Australian waters in the south. It seems to be a cosmopolitan pelagic fish, but one more frequently found north of the equator.

It is not remarkable that so striking a fish has been recorded from times relatively far back, and that it has been extensively figured. The earliest figure known to me (and one hardly recognizable) is found in Robert Sibbald's "Scotia Illustrata"[8] and is unaccompanied by any description. Another early figure, and one so well drawn as to be identifiable at a glance, is found in C. Mortimer's article in the Philosophical Transactions for 1750.[9] This fish, which was three feet seven inches long, by three feet ten inches around, weighed eighty-two pounds. It was taken in shallow water at Leith, Scotland, and was sent to Mortimer together with a drawing by Ralph Bigland.

Cuvier and Valenciennes were the first to essay a colored figure.[10] This is not very accurate in the colors, and is apparently very inaccurate in its dorsal and ventral fins which are enormously elongated. Much better is the only other colored figure known to me, that in Couch (2nd ed., 1869, Vol. II, pl. 93). An interesting and probably a fairly accurate figure is that of Lowe's (1843–60, pl. 5) specimen taken off Funchal, Madeira, in 1835. Lowe's description of this specimen (three feet four and five tenths inches long and over sixty pounds in weight) is minute and dependable.

Of western forms we have two figures. Shufeldt's excellent figure, already referred to, shows fins as well as body with spots. Goode and Bean's figure is made from the same specimen but lacks the spots. However, most accurate of all is D. S. Jordan's figure[11] made from an excellent photograph of the largest known specimen (317.5 pounds) taken in the Honolulu fish market. This shows the ventral fins to be wider and less pointed than in any of the other figures (save Shufeldt's) and is particularly interesting in that all the fins, paired and unpaired, are as thickly covered with spots as is the body.

Judging by figures and descriptions there is considerable variation in this fish, which, however, is everywhere much compressed, very deep bodied and remarkably colored.

The family Lampridae is composed of the one genus and species, *Lampris luna*. Several species have been created, but it is generally agreed that all may be reduced to synonymy and that Gmelin's name *luna* applied in 1788 has priority. The affinities of the family are very doubtful. It has been shifted from one order and sub-order to another. Goode and Bean (1895) thought it allied to the Zeidae. Jordan and Evermann thought it akin to the dolphins (Coryphenidae), while Boulenger in the Cambridge Natural History (1904, p. 628) placed it next to the sticklebacks (Gasterosteidae). The latest ichthyologist to attempt to solve this puzzle is Dr. Regan, of the British Museum, who, after a study of the skull of *Lampris,* puts it in a new sub-order, Allotriognathidae. The interested reader will find Regan's article in the Proceedings of the Zoological Society of London, 1907, pp. 634–643. However, it is safe to assume that the systematic position of this rare and little known fish is as yet not fully settled.

The generic name *Lampris* is a Greek word meaning radiant, in allusion to the splendid colors of the fish. The specific name *luna* (moon) refers of course to its rounded form. Another specific name is *guiniensium*. For this and the common names opah and kingfish we are indebted to Mortimer (1750). He related that when the specimen sent to him by Bigland was on exhibition, an African prince from Anamaboe on the coast of Guinea, together with a Mr. Creighton, formerly governor of Cape Coast Castle, saw the fish. They declared that it was found on that coast, where it was called opah by the natives and kingfish by the English.

For an excellent and interesting history of the opah, the reader is referred to the citation from Cuvier and Valenciennes found above.

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[8] Edinburgh, 1684, pl. 6, fig. 3.
[9] Vol. 46, pp. 518–520, plate IV.
[10] 1835, Vol. X, pl. 282.
[11] "Guide to the Study of Fishes," 1905, Vol. I, fig. 199.